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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/669,982	09/23/2003	Steven Rosenau	10021114-1	8191
57299	7590	10/11/2006	EXAMINER	
AVAGO TECHNOLOGIES, LTD. P.O. BOX 1920 DENVER, CO 80201-1920			NORRIS, JEREMY C	
		ART UNIT	PAPER NUMBER	2841

DATE MAILED: 10/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/669,982	ROSENAU ET AL.
	<b>Examiner</b>	<b>Art Unit</b>
	Jeremy C. Norris	2841

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 18 July 2006.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-23 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) 1-10 is/are allowed.  
 6) Claim(s) 11-22 is/are rejected.  
 7) Claim(s) 23 is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 23 September 2005 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____ .
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)	5) <input type="checkbox"/> Notice of Informal Patent Application
Paper No(s)/Mail Date _____ .	6) <input type="checkbox"/> Other: _____ .

**DETAILED ACTION*****Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 18 July 2006 has been entered.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 11, 12, 14, 16-19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,137,168 (Kirkman) in view of US 2002/0046880 A1 (Takubo).

Kirkman discloses, an electrical connection assembly having vias (76) disposed to combine electrical discontinuity, said electrical connection assembly comprising; a circuit comprising a ground plane (82) separating a first surface and a second opposing surface, said first surface having a first transmission line (74) and said second surface having a second transmission line (78); and vias (76) that pass entirely through the circuit closest to a first region of electrical connection pads (68) configured to receive a wirebond (69) and offset from connectors (70) on said second opposing surface, one of said vias electrically coupling said first transmission line and said second transmission line wherein said wirebond generates electrical discontinuity and said via generates electrical discontinuity and wherein said via is proximate said first region of electrical connection pads for substantially collocating said electrical discontinuity caused by said wirebond and said electrical discontinuity caused by said via thereby minimizing discontinuity in the electrical connection assembly. Kirkman does not specifically state that the circuit is flexible [claim 11]. However, it is well known to make circuits flexible as evidenced by Takubo ([0045]). Therefore, it would have been obvious to one of

ordinary skill in the art at the time of invention to make the circuit of Kirkman flexible as is known in the art and evidenced by Takubo. The motivation for doing so would have been to allow the device to flex and thus make it more resistant to cracking.

Additionally the modified invention of Kirkman teaches, wherein said first region of electrical connection pads comprises at least one via capture pad (48) [claim 12], further comprising a second region of electrical connection pads (70) comprising a ball grid array (figure 3) [claim 14], wherein said first region of electrical connection pads has an areal density (see figure 18A) less than a second region (27) of electrical connection pads (see figure 18C) [claim 16], wherein said first region of electrical connection pads are a linear array of pads (see figure 18A) [claim 17].

Regarding claim 18, Kirkman discloses a circuit assembly having vias (76) disposed proximate a plurality of bond pads (68) to minimize electrical discontinuity in said circuit assembly, said circuit assembly comprising: a circuit comprising a first surface and a second opposing surface separated by a ground plane (82), said first surface having a first conductive layer (74) coupled thereto and said second surface having a second conductive layer (78) coupled thereto; said plurality of bond pads coupled to said first conductive layer and configured to receive a wirebond (69) electrical connection, said bond pads offset from connectors on said second surface; electrical connection pads (70) coupled to said second conductive layer configured to electrically couple an external electrical assembly to said second conductive layer; and vias that pass entirely through the circuit the vias configured to receive a wirebond (69) and offset from connectors on said second opposing surface, said vias enabling

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electrical coupling of said first conductive layer and said second conductive layer, said vias disposed to minimize discontinuity in said circuit assembly. Kirkman does not specifically state that the circuit is flexible or that the vias are collocated with said plurality of bond pads [claim 18]. However, it is well known to make circuits flexible and to collocate pads and vias as evidenced by Takubo (figure 3, [0045]). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to make the circuit of Kirkman flexible as and to collocate the pads and vias as known in the art and evidenced by Takubo. The motivation for doing so would have been to allow the device to flex and thus make it more resistant to cracking and to increase the signal wiring density.

Also, the modified invention of Kirkman teaches wherein said plurality of bond pads are via capture pads (48) [claim 19], wherein at least one of said vias shares one of said plurality of bond pads (see fig. 16) [claim 21],

Claims 13 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,137,168 (Kirkman) in view of US 2002/0046880 A1 (Takubo) as applied to claims 12 and 21 above, and further in view of US 2002/0139566 A1 (Strandberg).

The modified invention of Kirkman teaches the claimed invention as described above except the modified invention of Kirkman does not specifically state that the pads are substantially teardrop shaped [claims 13, 22]. However, it is well known in the art to use teardrop shaped pads in electronic devices as evidenced by Strandberg (see [0037]). Therefore, it would have been obvious to one having ordinary skill in the art at

the time of invention to shape the pads of the modified invention of Kirkman in teardrop shape as is known in the art and evidenced by Strandberg. The motivation for doing so would have been to use pads with a smaller footprint to allow for more dense signal wiring. Moreover, it has been held that more than a mere change of form is necessary for patentability. Span-Deck, Inc v. Fab-con, Inc. (CA 8, 1982) 215 USPQ 835.

Claims 15 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,137,168 (Kirkman) in view of US 2002/0046880 A1 (Takubo) as applied to claims 11 and 18 above, and further in view of US 6,396,712 (Kuijk).

Modified Kirkman discloses the claimed invention as described above except the modified invention of Kirkman does not specifically state that the first type of electrical connection pads is configured for coupling an optical module thereto [claims 15, 20]. Instead, the modified invention of Kirkman generically states that the component is an integrated circuit (see col. 6, lines 20-30). However, it is well known in the art to use optical integrated circuits chips as evidenced by Kuijk (see col. 4, lines 25-45). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to use an optical IC as the IC chip in the modified invention of Glenn as is well known in the art and evidenced by Kuijk. The motivation for doing so would have been to allow the device to process electronic and optical signals thus making the device more flexible.

#### ***Allowable Subject Matter***

Claims 1-10 are allowed.

Claim 23 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Claim 1 states the limitation "wherein said second type of electrical connection pad array is arranged to have a higher areal density than said first type of electrical connection pads". This limitation, in conjunction with the other claimed features, was neither found to be disclosed in, nor suggested by the prior art. Claim 23 states the limitation "wherein said plurality of bond pads are disposed with an areal density less than said connection pads". This limitation, in conjunction with the other claimed features, was neither found to be disclosed in, nor suggested by the prior art.

***Response to Arguments***

Applicant's arguments with respect to claims 11-22 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy C. Norris whose telephone number is 571-272-1932. The examiner can normally be reached on Monday - Friday, 9:30 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean Reichard can be reached on 571-272-1984. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JCSN

  
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